

# Ninhydrin

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# Ninhydrin

## 1 INTRODUCTION/SCOPE

- A. Ninhydrin is used by FBI Laboratory Friction Ridge Discipline personnel to develop prints on porous and semi-porous surfaces.
- B. It reacts with the amino acids that are present in perspiration.

## 2 STANDARDS AND CONTROLS

See *Processing Overview* ([FRD-300](#)).

## 3 LIMITATIONS

None

## 4 EQUIPMENT

- Humidity chamber or steam producing device
- Ninhydrin
- Acetone
- Petroleum Ether
- Isopropanol
- Methanol

## 5 PROCEDURE

### 5.1 Solution Preparation

Personnel will prepare the solutions as follows. Alternative amounts may be prepared, provided the same ratio of chemicals mixed is retained.

#### 5.1.1 Ninhydrin (Petroleum Ether) Solutions (Large Quantity)

##### 5.1.1.1 *Ninhydrin stock solution*

- A. Combine:
  - Ninhydrin – 700 g
  - Methanol – 3500 mL
- B. Stir until Ninhydrin dissolves.

##### 5.1.1.2 *Ninhydrin working solution*

- A. Remove 1500 mL of Petroleum Ether from the approximately 20 L container.
- B. Combine:
  - Isopropyl Alcohol – 800 mL
  - Ninhydrin stock solution – 700 mL
- C. Add to the remaining Petroleum Ether in the approximately 20 L container.
- D. Agitate container to mix solution.

### 5.1.2 Ninhydrin (Petroleum Ether) Working Solution (Small Quantity)

- A. Combine:
  - Ninhydrin – 5 g
  - Methanol – 30 mL
- B. Stir until Ninhydrin dissolves.
- C. Add:
  - Isopropyl Alcohol – 40 mL
  - Petroleum Ether – 930 mL

### 5.1.3 Ninhydrin (Acetone) Working Solution

- A. Combine:
  - Ninhydrin - 6 g
  - Acetone - 1000 mL
- B. Stir until Ninhydrin dissolves.

## 5.2 Application

### 5.2.1 Standard Method

- A. Personnel will complete the following steps in order:
  1. Apply solution to item.
  2. Allow item to dry completely.
  3. Place in humidity chamber at 70%-80% relative humidity and 70-80°C for approximately 5 minutes or until desired development occurs.
- B. Capture appropriate friction ridge detail as applicable (digitally or photographically).

## 5.3 Alternate Methods for Development

- A. Personnel may apply damp heat with a steam producing device (e.g., steam iron) for several minutes.
  1. If latent print development is insufficient, continue to apply damp heat for a few additional minutes.
- B. In some circumstances, heat may be detrimental to the condition of the item(s).
  1. In these circumstances, the item(s) may be left to dry and then placed in a sealed bag or container at least overnight or until development occurs.
- C. The use of alternate methods must be recorded in the case record.
  1. If an alternate method is used to test a reagent, the method needs to be recorded in the reagent log or the case record (if off site).

## 5.4 Storage

- A. Stock solution must be stored in a dark glass bottle.
- B. Working solution may be stored in any of the following receptacles:
  - Dark glass bottle
  - Metal can
  - Stainless steel container

## 5.5 Shelf Life

- A. Stock solution has an indefinite shelf life provided the reagent checks are satisfactory.
- B. Working solution has a shelf life of 1 year provided the reagent checks are satisfactory.

## 6 SAFETY

See [FBI Laboratory Safety Manual](#) for appropriate information.

## 7 REVISION HISTORY

Revision	Issued	Changes
02	07/15/2021	Replace Latent Print Units with Friction Ridge Discipline. Minor wording changes. Streamline equipment list and generalized steam iron. Re-organization and re-numbering of sections. Section 3.1 - separated into Section 3.1.1 and Section 3.1.3 and added Section 3.1.2 from previous version of Ninhydrin document. Section 3.2.2.1 - generalized steam iron. Section 3.2.2.2 - modified expectations for development. Section 3.2.2.3 - added location. Section 4 - added Preamble reference.
03	07/01/2022	Format Updated.